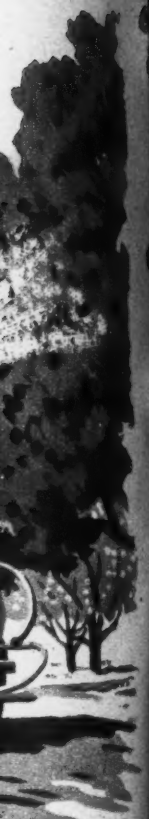


*American*

# FRUIT GROWER

MAY

1946



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AMERICAN FRUIT GROWER

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AMERICAN FRUIT GROWER



MAY  
VOL. 66

1946  
No. 5

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MAY,



# LETTERS TO THE EDITOR

## Wind As a Pollinator

Dear Sirs:

Has the wind a tendency to aid in pollination? Of course, the wet season of last year was a bad drawback, I know.

Seranton, Pennsylvania

A Subscriber

*The wind may be a factor in the cross-pollination of fruit plants but it is usually of minor importance. Insects, especially honey bees, are the most active agents affecting pollination.*

*A wet, cool period during bloom often reduces the set of fruit because insects are prevented from making their normal visits to the flowers. Consequently there is a lack of good pollination.—Editor.*

## Controlling Apple Scab

Dear Editor:

I have read with much interest your article "Machinery for Applying Scab Control Sprays and Dusts." (Feb. '46.) It's getting closer to my experience but still off somewhat—like the man who didn't quite get into heaven. He ended up near-to-close, but just outside.

I have sprayed for many years from a 9 ft. tower atop my spray tank. Had good control of scab from that level down but very poor indeed where I had to direct the spray upward. Scab spores floating through the air seem subject to gravity just like any dust so it is the top side of the leaves that gets infected and not the bottom. Examination shows that where the spray is directed upward, the tops of the leaves are very poorly covered.

The vigorous tops of my trees have not produced nearly so well as the lower weak limbs.

This winter I built a telescopic mast atop the spray tank. It is swiveled at the bottom and turned by a stick at the bottom. The same stick turns the spray up or down so everything can be reached. Thus the gun can be elevated to spray the tall trees from above or lowered to get the small ones. I want more from those vigorous tops and I think this year maybe I can get it.

Jackson, Michigan

L. B. Benton

*Your idea of using a telescopic mast to facilitate a more thorough application of spray material in the tops of the trees sounds very practical. Such homemade mechanical devices often work out to a fair degree of satisfaction.—Ed.*

## Sawdust As Mulch

Gentlemen:

Even though I raise fruit and grapes as a hobby in a very small way, I enjoy your magazine more than any other of some fifteen trade, sporting and other types of magazines I subscribe to.

As it happens, I also operate a small sawmill, cutting cottonwood. As you may know, this wood, in contact with the ground, is very perishable. Carloads of sawdust accumulate quickly. Why, since this is a non-resinous wood, would not this material be ideal for a mulch for orchard and vineyard?

If there are no facts available as to the use of this material, I thought I would mulch half of each planting and see what happens. Of course, I'd hate to do anything that would injure my little planting, now 4 years old.

Hutchinson, Kansas

E. H. Schroeder

*Sawdust should make an excellent mulch for your small planting. Since it is largely a cellulose material and decays rather rapidly in the soil, it should serve equally as well as straw which is also a cellulose material.—Ed.*

## Pricing a Tree

Dear Sir:

I set out my prize tree orchard five years ago, using the best trees obtainable. Many are the exclusive Stark and Burbank strains; many are newly introduced and patented strains in the best varieties. From only two of my trees, when they were three years old, I sold twenty dollars worth of fruit. I have given my trees my best care and I prize them highly.

My orchard is alongside of a main highway where I can sell all my fruit from my market at a nice profit. Among my trees I had a nice new Gorham pear, 5 years old, fruit as large as a cup, and the tree about 12 feet high and 8 feet wide at the top.

A party drove off the highway and into my Gorham pear tree breaking it off at the base. In asking payment for the damage, I've valued the tree at fifty dollars (\$50.00). I'd like to have the opinion of other fruit growers if they think I'm right or if they think I'm too high. I'd like to know what you think the value of such a tree might be.

Some of you readers who have some real nice 5-year-old trees, just let me know at what value you believe yours to be worth either commercially or to your property.

Star Orchard

John L. Widner

Jacksonville, Missouri

*What about it readers? What price would you put on your five-year-old trees?—Ed.*

## Salem Versus Danvers

Dear Sir:

I wish to call attention to an error in your geography in your last issue. (March 1)

You say the "Famous Endicott Pear Tree in Salem, Massachusetts." It definitely is not in Salem. It is in the Danversport section of Danvers, Massachusetts. The tree is on the high ground above tide level on the North side of the Waters River, which at that point divides Peabody and Danvers. I learned to swim, did my first fishing and hunting of shore birds, trapped muskrats—in fact spent a whole lot of my kid's play there on the Peabody side of the Waters River, directly across the river from the Endicott Pear Tree.

I'm rather hazy on the history now, having left that region 30 years ago, but I'm quite sure that at one time Peabody was a part of Danvers. I almost think that Danvers was at one time a part of Salem. I'm not sure, though, of course, that could easily be substantiated. If that were correct the tree might originally have been in Salem, but to be correct now it would be necessary to say it is in Danvers:

Henniker, New Hampshire R. C. Coombs

*The Endicott Pear Tree is located on Endicott St., Danvers, Mass. Endicott Street is in the section of Danvers, Mass., known as Danversport. In 1692, the city of Danvers was part of Salem, Mass. For this reason, the Endicott Pear Tree is often historically located in Salem.—Ed.*

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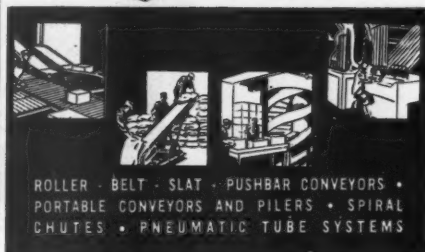
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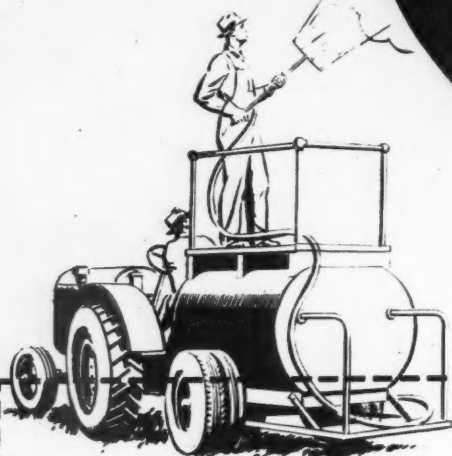
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GROWER



# The Great Mystery OF POLLINATION

By PHILIP FERRY

THE most mysterious phenomenon connected with the plant world is undoubtedly that of pollination. Pollination is a dramatic, a vital and a continuously operating process which goes on all through nature. Unaware as we may be of this phenomenon, it nevertheless continues unabated. All living creatures must eat; in the process of procuring food, all insects and most animals aid in disseminating pollen—the latter the lifeblood of plants. The whole operation is an unbroken cycle: animal—plant—pollen—food. Investigation has revealed that almost every creature that moves on the face of the earth plays some part in the perpetuation of plant life. It is interesting to reflect that for untold centuries plants and insects have unknowingly been complementing each other in this process of mutual assistance.

Pollen is the male product of the plant. Pollination is the transfer of the pollen from the male to the female parts of the flower and is merely a preliminary to other changes which culminate in fertilization. Pollination and fertilization are very different processes. Pollination is merely the transfer of the pollen grains from flower to flower; fertilization is the merging of the male element or sperm

and the egg nucleus. The union of these germ cells brings about the fertilization of the eggs in the ovules of the ovary and the subsequent development into seed.

There are two distinct types of pollination: self-pollination (autogamy), in which pollen is transferred from the stamen to the pistil of the same flower; and cross-fertilization (alogamy) in which the pollen is carried to the pistil of another flower on the same plant or to another plant of the same species. As the pollen-bearing stamen is rarely in contact with the female stigma at the time when both of these are ripe, some means is clearly needed to bring the pollen to the female organ. There are countless methods of accomplishing this union, the more common being pollination by insect, wind, bird, or animal agency, and even pollination by water. Perhaps the most celebrated carrier of pollen is the bee; the most picturesque the hummingbird; the most spectacular the Pronuba moth which fertilizes the Yucca plant of western deserts.

Even the lowly ant, slug and snail participate in this universal phenomenon. Squirrels, by forgetting where they hide part of their trove also aid, their poor memory being an important factor in the propagation of forests.

Woodpeckers assist in pollination by storing acorns in trees. Some species of bats are known to help in the pollination of flowers and plants, the African "sausage tree" being apparently especially adapted to cross pollination by bats. Even humans unwittingly aid in the process of dissemination. A person walking through a field of flowers may become a pollinating agent. When wild oats cling



Honeybees at work in a cluster of blossoms.

to a person's garments, that person automatically becomes a disseminating agent; although the seed pods were designed to cling to the hooves and hides of animals, and although man was not considered in the original design, such a person assists wily nature in the scattering of seed and pollen—a highly important function in nature.

Insects are the chief agent in the work of pollination, and the great variety in color, form and scent of flowers has been developed in relation to the precise insect pollinator which serves each particular species. When we speak of the great mystery of life, we must include insects as one of the chief instruments in the furtherance of this unfathomable design. Most plants pollinated by insects have conspicuous flowers or a distinct odor or both. All such flowers have glands which secrete nectar, the latter the lure that brings insects to plants. Nectar is the sugary liquid from which bees manufacture honey, and there are more than 2000 different plants growing in the United States from which the insects extract the substance. The term is derived from the name given by the Greek poets to the drink of the ancient gods. Without the plant and its nectar, the in-

(Continued on page 31)

MAY, 1946

# PROBLEMS OF ORCHARD POLLINATION

By John R. Magness, Head Horticulturist in Charge, Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, Soils, and Agricultural Engineering, Agricultural Research Administration, U. S. Department of Agriculture

ABOUT half a century ago, it was first discovered that we have a pollination problem with certain of our orchard crops. At that time, Mr. M. B. Waite discovered that a number of pear varieties would not set fruit unless fertilized with pollen from another variety. His work introduced the pollination problem into orchard management. Prior to that time orchards generally included many varieties, and the pollination problem was not recognized.

Since Dr. Waite's early work, pollination studies have been made on all important fruit crops. We now know that some kinds of fruits are generally self-fruitful, setting full crops with their own pollen. These include the citrus fruits, peaches, apricots, sour cherries and most of the Domestica or European plum and prune varieties.

We also know that other kinds generally are not fully self-fruitful, and cross pollination is essential to a full set of fruit. This group includes apples, pears, sweet cherries, and Japanese plums. Within this group, some varieties will set partial crops without cross pollination but for full production, crossing is needed. We also have some varieties, particularly in sweet cherries and Japanese plums, that are inter-sterile. Thus with these kinds of fruits provision for cross pollination should always be made when the orchard is set.

The table on this page lists the 24

leading apple varieties of the United States, with the season of bloom, and whether or not they are good pollen producing varieties.

In planting the orchard, varieties should be so arranged that all trees are within 100 feet or less of a good pollinizer. Thus not more than four rows of a variety should be planted in a block, with suitable pollinizers on each side. Varieties listed as poor pollen producers should not be depended on for pollination purposes.

The general season of bloom is also

indicated in the table. Generally early and medium-blooming varieties will cross pollinate satisfactorily, and medium and late, but the overlap of bloom between early and late bloomers may not be sufficient for satisfactory pollination.

Many orchards now in production do not have suitable pollination conditions. Large blocks of Winesap and Stayman, or solid Delicious or Mc-

Left—Pollinating "bouquet" method on low tripod in a solid block of York Imperial apples. Photo by Bureau of Plant Industry, Soils, and Agricultural Engineering, U.S.D.A.



This grower insures cross-pollination by placing bouquets of blossoms in his trees.

Intosh orchards frequently do not set full crops for this reason. What steps can the grower take when he has such a condition?

First of all, if the orchard is not too old, he should take steps to permanently correct the problem by grafting over certain trees to good pollinizer varieties. Every third tree in every third row is a safe recom-

(Continued on page 28)

Variety	Season of Bloom	Value as Pollinizers
Delicious (and color strains).....	Medium	Good
Winesap " " " .....	"	Worthless
Jonathan " " " .....	"	Good
Baldwin.....	"	Poor
Stayman Winesap (and color strains).....	"	"
Ben Davis (and color strains).....	"	Good
Rome Beauty " " " .....	Late	Good
York Imperial " " " .....	Medium to late	"
McIntosh " " " .....	Medium	"
Grimes Golden.....	"	"
Yellow Newtown.....	"	"
Wealthy.....	"	"
Yellow Transparent.....	Early	"
Rhode Island Greening.....	Medium	Poor
Northern Spy.....	Late	Good
Gravenstein.....	Early	Poor
Duchess of Oldenburg.....	"	Good
Arkansas (Black Twig).....	Medium	Poor
Golden Delicious.....	"	Good
Esopus Spitzenburg.....	"	"
Wagener.....	Early	"
Stark.....	Medium	Poor
Winter Banana.....	"	Good
Cortland.....	"	"



# LOOKING FORWARD To The 1947 Apple Crop

By A. J. HEINICKE  
New York Experiment Station

THE title of this article implies that it may not be too early for the orchardist to think about the 1947 crop. Of course, we are not yet sure what the crop will be in 1946. Every fruit grower knows that unfavorable weather from now on until the latter part of the growing season can blast the prospects for a good harvest.

Such hazards as late spring frosts, before or after buds open, cold or rainy weather during bloom that injures the flower parts or interferes with pollination, a heavy "june drop," loss of a large part of the growing fruit from insects and diseases, from hail and wind, or from a premature drop just before harvest are all too familiar experiences in many orchards. A good set of clean fruit in early summer does not necessarily mean a heavy crop, especially in dry seasons. If the apples fail to size properly due to lack of water or nutrient materials supplied from the soil and by the leaves, the crop may be only 1/2 to 2/3 as large as indicated by the set in early summer.

It is a very simple matter, however, to determine whether or not the possibility for a crop exists many months before the flowers normally open. This can be done by examining the buds to see whether or not they have live flowers. If present, the flower parts can be exposed by cutting through the buds while still dormant or after they begin to swell. A few twigs may be removed from the trees

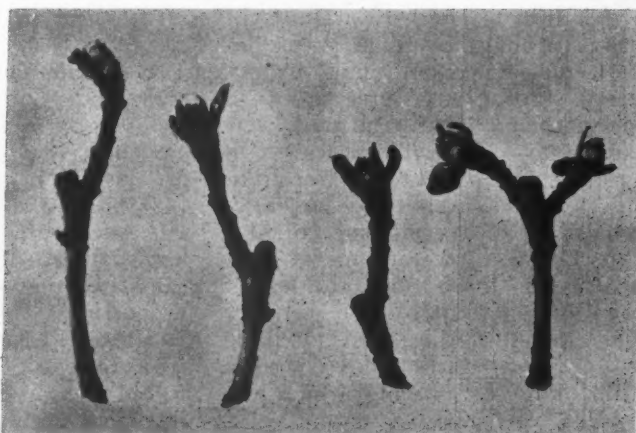
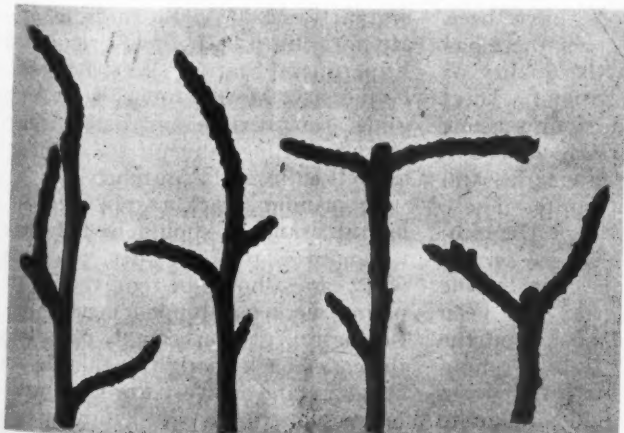
and placed with the cut ends in a jar of water and forced in a warm room. If there are any flowers in the buds, they will appear within a few weeks' time. If there are no flowers present in the buds, it is impossible to have any fruits in 1946.

Most fruit growers know that the flower buds that open in spring begin to form very early in the previous season. Through microscopic examination of the very small buds, it has been shown that the embryonic parts of the flowers may be present as early as the latter part of June, approximately 8 or 9 months ahead of the time that they open. Not all the flower buds, however, begin their develop-

ment at the same time, and initial stages may be observed for several months, in some cases as late as August. Once a flower bud has been started on its way, it may undergo

(Continued on page 22)

Below left—Fruit spurs from an apple tree of low vigor. None of these spurs show indications of blossoming. Below right—Fruit spurs from a vigorous tree of the same variety. These spurs are making a satisfactory growth, and blossom buds are unfolding.



Photograph courtesy of Better Homes and Gardens Magazine



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# NATIONWIDE FRUITS



Pear blossom scene in Hood River Valley, Oregon, with Mt. Adams in the distance.

## PEACHES

### Heavy Pruning Lowers Production

As recently reported in the Missouri "Horticultural News" by Dr. Aubrey D. Hibbard of the University of Missouri's Horticulture Department, studies in progress at the Campbell Field on pruning peach trees show that the removal of even a moderate amount of wood may materially lower production. In his zeal to properly train the young trees, the grower may be literally cutting away his future crops, says Dr. Hibbard. The undesirability of heavy pruning of young trees has been indicated by pruning experiments starting with three year trees and continuing until the trees were eight years of age. Three degrees of pruning were given to the trees. The heaviest was called "moderate", which is the heading and thinning type usually recommended. Trees that were thinned but not headed were designated as "light" pruning. Only the interfering, dead, and broken branches were removed in the third kind of pruning which was labeled "corrective."

As determined by the weight of

the wood removed, the light pruning was twice as severe as the corrective type while the moderate was three times as severe. Dr. Hibbard reports that before pruning in 1945 the trees in all treatments were of approximately the same height despite annual heading of the moderately pruned trees. Trunk measurements revealed that the trees given the lightest pruning were slightly over one-half inch larger in circumference. With respect to cultivation, fertilization, spraying, and thinning, the trees have been given identical culture.

Although four crops have been harvested from these trees, there has been no difference in the quality of fruit under any treatment. Total yields per tree for the four seasons have been 17.2 bu. for the corrective pruning, 16.4 bu. for the light, and 14.7 bu. for the moderate. These differences seem small, says Dr. Hibbard, but when the loss per acre is calculated they assume considerable proportions. If the crop had been worth only \$1.50 per bushel on the tree, the loss from light pruning would be \$91.50 while that from moderate pruning would amount to \$285.00 per acre.

In conclusion, Dr. Hibbard reports that not only was there a loss of fruit but the moderately pruned trees required three times as much labor for pruning. So far there has been no greater breakage in the corrective pruned trees. Moreover the fruit has not been any more difficult to harvest.

## BERRIES

### Pruning Small Fruits

If small fruits are to yield well and be easily kept in bounds, all except the strawberry must be pruned regularly, says W. H. Childs, associate horticulturist at the Agricultural Experiment Station, West Virginia University, Morgantown, West Virginia. Raspberries and blackberries must be pruned during the summer as well as in early March.

In pruning black raspberries, the lateral branches should be cut back to about 8 to 12 inches, and any weak canes should be removed. If the plants were not topped last spring, the best a grower can do is to cut the canes back enough so that he can cultivate and harvest the fruit without undue trouble.

Purple raspberries are treated the

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same as blackcaps except that the laterals are left about two inches longer. Red raspberries should be thinned to about 6 or 8 inches apart in the hedge-row, and any that exceed five feet in height should be cut back to that height if they bend over in the way.

The pruning of blackberries resembles that of both red and black raspberries in some respects. The laterals should be cut back to 18 inches in length, and the plants thinned to about 6 to 8 inches apart in the hedge-row.

Canes which bore last year should be removed from all raspberries and blackberries, if this has not already been done.

With currants and gooseberries, pruning consists chiefly of removing any canes more than three years old, and limiting the number of one-year-old canes from the crown to about eight. Any dead wood should be removed also.

With all these fruits, it is advisable to carry all prunings from the patch and burn them, since they often serve as a source of disease.

## APPLES

### Oldest Apple Tree of Northwest

In the Vancouver Barracks, Washington, there stands an apple tree of more than ordinary importance. Its history was so interesting that Bancroft, the noted historian, says of it: "At a lunch party in London, about 1825, given in honor of some young gentlemen who were about to embark for Fort Vancouver in the employ of the Hudson Bay Company, seeds of the fruit eaten were slyly slipped by some young ladies into the waistcoat pockets of the young men. Upon their arrival at their destination, the young men, in overhauling their wardrobes, found the seeds and gave them to Bruce, the gardener at the Fort."

Mrs. Mary Whitman, wife of Marcus Whitman, also wrote an interesting history of this tree on September 12, 1836. It is said that the seeds planted by the gardener produced several trees, three of which lived for a long time, and were pointed out as the only apple trees in the Northwest. In the course of time two of them died, leaving the present tree alone.

Even the existence of this tree seems to have been almost entirely forgotten by the public, not even the commander of the barracks knowing that such a tree stood on the very ground which he controlled. It was largely through the horticultural inspector of this district, A. A. Quarnberg, that the tree was discovered and identified. In 1911, Mr. Quarn-



The sign in front of the tree reads: "The oldest apple tree in the Northwest grown from seeds brought from London, England, planted in 1825 by the Hudson Bay Co."

berg wished to have a gavel made of wood from the tree for the Washington State Horticultural Association, and, upon examining the tree, found it badly infested with San Jose scale, half of its branches dead, and in a bad condition generally. On January 13 of that year he called upon Col. G. K. McGunnigle, Com-

mander of the Barracks, and got the necessary permit to prune, spray, and do anything necessary to preserve the life of the tree.

On January 25, 1911, by direction of the Washington State Commissioner of Agriculture, he took measurements and found the tree to have the following dimensions: one foot from the ground, diameter 1½ feet; height 33 feet; spread of crown 33 feet. On February 21, 1911, the tree was pruned and all dead branches and brush removed, the decayed part of the trunk and branches cleaned out and filled with plaster of Paris and cement, and all cuts painted.

The tree is evidently a Yellow Bellflower seedling. In 1915 the Department of Agriculture at Washington, D.C., requested Mr. Quarnberg to send them specimens of apples for making wax forms. The picture on this page shows this tree after it was pruned.—H. E. Zimmerman.

### The Fruit With the Zipper Skin

The same Italian sailor who is credited with the discovery of the New World in 1492 also brought the seeds of citrus fruits from Spain to the Canary Islands on his second voyage, and years later the Spanish conquistadores carried the fruits to Florida where they have flourished ever since.

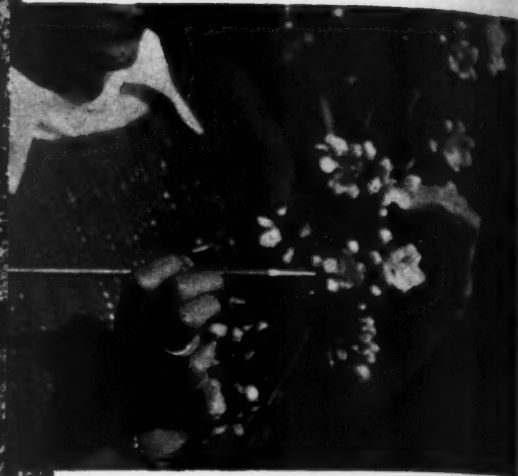
The tangerine has made a definite place for itself as a favorite winter fruit—the fruit with the zipper skin—in spite of the greater volume of its citrus, the orange and  
(Continued on page 23)



Left—Dr. P. Phillips of Orlando, the largest individual tangerine grower in Florida.







Left—Blossom time in the Cashmere Valley near Wenatchee, Washington.—Photo from the Liberty Orchards Co., Cashmere. (Above)—The central blossom in the cluster is usually pollinated shortly after the petals have unfolded. It is important that the pollen is placed on all five stigmas.

# HAND POLLINATION OF DELICIOUS In The Wenatchee, Washington Orchards

By B. ESTHER STRUCKMEYER  
University of Wisconsin

**D**IFFICULTIES have been experienced in the setting of fruit in Delicious growing in Wisconsin. There are some known peculiarities of Delicious and some possible ones which might contribute to the difficulty of getting this variety to set satisfactorily. One of these which contributes to the trouble is blossom structure. In the AMERICAN FRUIT GROWER for April, 1945, Dr. R. H. Roberts described the structure of the Delicious blossom. He showed that the structure of the blossom permitted bees to extract nectar from the base of the flower without having to crawl over the stigmas and stamens, resulting in the failure of the bees to pollinate the blossom. The petals of this variety are flat and assume a position at approximately right angles to the upright pistil and stamens, so that it is not necessary for bees to enter the flower through the pistil and stamens in order to reach the nectaries. In apple varieties where the filaments bearing the anthers are wide spread or the petals are cupped, bees reach the nectaries only by passing over the stamens and pistils, thereby pollinating the flowers. Varieties with this type of blossom set fruit readily with bee pollination. Furthermore, the

pistils on the Delicious blossom are short, so that bees may not touch the stigmas even when collecting pollen.

A second peculiarity of Delicious is the observed preference bees may have for other varieties of apples or plants blossoming at the same time. Although there may be enough bees in the orchard for good pollination, they may be attracted to other varieties of apples in preference to Delicious to the extent that there is an insufficient number visiting Delicious trees to effect adequate pollination. It has been suggested that the nectar in Delicious is not as attractive as it is in other varieties, or possibly the nectar is desirable to bees for only a short time instead of the entire blossoming season. As Delicious is self-sterile, it is also important to have good pollinizers close to the Delicious trees.

Since bees are important in cross-pollination, why not have enough of them to overcome the handicaps to which Delicious may be subject? This would entail the expense of bringing in bees, but probably more important is the fact that bringing in an abundance of bees for Delicious is apt to result in over pollination of other varieties, and since over pollinated trees need hand thinning it is apparently



In collecting the pollen for hand pollination, a flower is removed from the spur and rubbed over a mesh screen so that the anthers fall into the collector's jar.

cheaper to hand pollinate and cut down thinning expense.

Hand pollination is a common practice in the Wenatchee Valley in Washington. On a visit to this section the writer was able to observe the collecting, curing and application of pollen to the blossoms. Some of the common varieties used as sources of pollen for Delicious in Washington are Jonathan, Golden Delicious, Newtown, Winter Banana and Rome Beauty.

Hand pollination in Washington is done on a commercial scale. The first step is collecting the pollen. The dealers who make a business of gathering

(Continued on page 32)

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continue for nicotine products essential in protection of food. We suggest that growers conserve their nicotine supply for their most important protective sprays of the growing season.

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Four truckloads of honeybees, contracted for on a rental basis, moving into an orchard for distribution at pollination time.

## HOW A BEEKEEPER SEES IT

### Beekeepers' Viewpoint on the Pollination Problem

By R. H. KELTY, Michigan State College

**S**INCE January 1, I have conducted beekeepers' meetings in approximately thirty Michigan counties, in and out of the Michigan fruit belt. The situation calls for frank appraisal and discussion. Beekeepers are apprehensive about spray poisoning. Many who have rented bees formerly will not do so this year because of their sorry experience last season. Many of those who are willing to try it again are demanding a higher rental price to offset increased labor costs and risk of poisoning. There is a strong tendency among larger beekeepers in the fruit belt to move their bees completely out of the commercial orchard area until more is known about the effect of DDT on bees in orchards.

In our opinion, fruit growers should prepare to handle their pollination problems in a more orderly manner. Random rental of a few hives of bees here and there, on the last days before the blooming period, without assurance of strength of colony, food supply or time of delivery and removal of the bees from the orchard, is a loose business arrangement.

The beekeeper who depends upon his bees for a living, depends upon the strength of his colonies for honey production. The beekeeper who keeps a few bees without much attention, may not even know whether his colonies are strong or weak or hungry or free

from disease. To secure a supply of bees in quantity for pollination, fruit growers may need to contact commercial beekeepers, most of whom are not located in the fruit belt. This may involve transporting the bees a considerable distance at added expense, and it may involve a higher rental price to cover actual costs, but it is likely that the fruit grower will get more for his money in actual pollination service if he deals with estab-

lished, successful commercial honey producers whose income depends upon strong colonies.

The fruit grower should expect to get strong colonies of bees, capable of heavy bee flight on days of favorable weather conditions during the blooming period. From such colonies, there may be from 100 to 200 bees flying per minute when the temperature is above 70, on bright, calm, balmy days. Under the same conditions, from weak colonies there may be flying less than 50 bees per minute. Strong colonies containing six or eight or more combs of brood, need a reserve food supply of twenty or more pounds of honey, or they may starve in mid-bloom in cool rainy weather. The bees should be properly prepared for moving so that inexperienced helpers can handle the hives without danger of stinging. Comparatively sheltered spots should be chosen in the orchard for the bees,

(Continued on page 33)



A bee yard on a Clinton County farm in Ohio.



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# HISTORY OF HORTICULTURE

## Founding of the American Pomological Society

### PART I: RULES OF POMOLOGY

By R. L. McMUNN

Department of Horticulture  
University of Illinois, Urbana, Illinois

THE Centennial year of the American Pomological Society is fast approaching. Because there is some question as to the correct date of the organization of the Society it seems advisable to trace the events and mention the factors or forces leading up to its organization. One of these factors was the chaotic condition of pomological nomenclature. Another was the previous existence of two societies which could be consolidated. To appreciate better the founding of the Society it seems advisable to present the facts in four parts, each part being presented in a different issue in this magazine. Part I will deal with the adoption of rules of pomology or nomenclature. This subject was, as it is now, of prime importance to nurserymen and pomologists. Parts II and III will sketch the early history of the two organizations that consolidated to form the American Pomological Congress (Society). Part IV will take up the consolidation of the two Societies to form the American Pomological Congress (Society) and the first few meetings of this Society.

Although there were several horticultural societies in the eastern states prior to 1846 none apparently had rules for their guidance in naming varieties, establishing priority, or correcting synonyms. The confusion was so great that a single variety was often known under many names. Nurserymen, growers and pomologists alike realized the great confusion, but little or nothing could be done to straighten it out as long as there were no generally accepted rules.

Shortly after A. J. Downing's book, "Fruit and Fruit Trees of America" was published in 1845, a Mr. T. S. Humrickhouse of Coshocton, Ohio, had an article in the *Magazine of Horticulture* of February, 1846, in which he criticized parts of Downing's work, then proposed a set of rules that could be followed in naming fruits and establishing priority. This, so far as is known, is the earliest sug-

gestion of rules of pomology. In late September, 1847, a group of growers and nurserymen assembled at Columbus, Ohio, and organized the "Ohio Nurserymen and Fruit Growers' Convention." This organization adopted a set of pomological rules. Whether the set of rules was the same as that proposed by Humrickhouse is not known. Downing in the magazine *Horticulturist* of April, 1848, said the rules were the same as those proposed by the Massachusetts Society. (Downing was incorrect in this statement because the Ohio Convention adopted its rules before the Massachusetts Society proposed its rules).

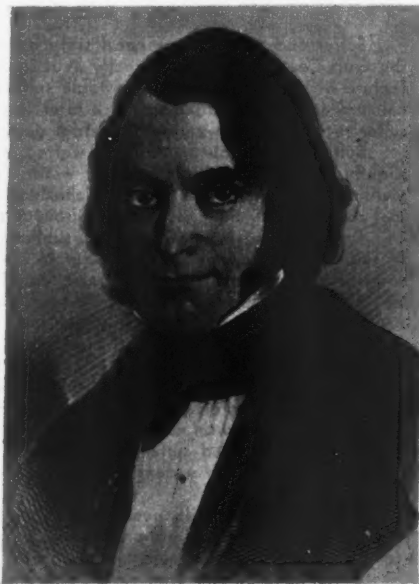
Whether the rules suggested by Humrickhouse prompted Downing to propose a set of rules is not known. At any rate, in the October, 1847, issue of the *Horticulturist*, Downing ran an article entitled "Pomological Reform" in which he suggested a number of rules that might be adopted by all societies for the sake of uniformity. In December, 1847, Downing had the pleasure of announcing in

the columns of the *Horticulturist* that the Massachusetts, Pennsylvania and Cincinnati Societies had adopted a series of "Rules for American Pomology." This set of rules was soon adopted by several other societies. It is this set of rules that the American Pomological Society later adopted.

In January, 1846, the New York State Agricultural Society appointed a fruit committee to bring in a list of recommended fruits. This committee reported the following year and then requested that it might continue its work for another year. This request was granted. At a committee meeting of the Agricultural Society on March 11, 1847, Downing's "Fruit and Fruit Trees of America" was made the authority of the Agricultural Society. Also at this meeting, Downing and J. W. Bissell were named to the fruit committee. During the Agricultural Society committee meeting on January 21, 1848, the fruit committee reported a "Set of Rules of Pomology" which were very short and varied somewhat from the "Rules for American Pomology," the set of rules that nearly approached the suggestions made by Downing in October, 1847. A few societies soon adopted the New York Society rules. Also at this meeting the fruit committee reported, "—and they also regret the non-reception of the lists recommended by those gentlemen (i.e. Downing and Bissell) until after the lists appended hereto was adopted, otherwise some additions might probably have been made to it,—." It seems probable that the "non-reception" of the Downing-Bissell list of fruits and the fact that the other members of the fruit committee presented a set of rules that were different from those suggested by Downing at an earlier date may have been the incentive for the animosity Downing showed towards the Agricultural Society, the Society that sponsored the North American Pomological Convention, one of the parent organizations of the American Pomological Congress (Society).

Much controversial material was written about the relative merits of the different rules. C. M. Hovey, editor of the *Magazine of Horticulture* was champion of the New York rules; Downing was the standard bearer for the Massachusetts rules. This was the start of the ill feeling that was to last for two years. It was probably one of the reasons why two national conventions organized in the fall of 1848, rather than meeting as a single organization.

Regardless of the merits of the different rules, the credit for proposing the first set of rules must go to Mr. T. S. Humrickhouse, and the laurels for adopting the first set of rules to the Ohio Convention.



Andrew Jackson Downing, famous American pomologist and landscape gardener.—Photo Massachusetts Horticultural Society.

# State



# NEWS

**MAINE**—Another Farm and Home Week at the University has been held. The Pomological program dealt with economic trends, tree vigor, apple insect control, and apple processing. Dr. J. K. Shaw of Massachusetts and Dr. J. J. Willaman of the Eastern Regional Research Laboratory in Pennsylvania spoke on this program. In addition, Dr. Willaman visited the chemical engineering laboratories where some processing is underway, and addressed an evening meeting on "The Work of the Regional Laboratories in Finding New Uses for Farm Products."

Kinds and varieties of fruits suitable for home freezing, and means of making a success with fruits in the home garden were scheduled in programs other than pomological.

Dr. Joseph A. Chukka, Agronomist and head of the department of soils and crops in the experiment station, has resigned and moved to Springfield, Mass., where he is associated with Eastern States Farmers' Exchange. Dr. Chukka had, in recent years, been devoting some attention to problems of orchard fertility and made a very real contribution in demonstrating that a leaf disorder long recognized in this State and called *leaf scorch* really results from a deficiency of magnesium, and that the symptoms disappear and the trees again become healthy when treated with magnesium in the form of Epsom salts. We share his confidence that applications of magnesium limestone will do the same, but more slowly.—J. H. Waring, Professor of Horticulture, University of Maine, Orono.

**MICHIGAN**—The outlook for fruit in Michigan for 1946 is very good. Moderate winter temperatures have been favorable. Peach trees have come through the winter with very little injury to the buds. Barring a repetition of last year's spring weather, the fruitfulness of Michigan orchards should be above average. Up to the twentieth of March the season has been a repetition of 1945 and there is considerable concern over the possibility of an early bloom.

The interest shown by the attendance of 1600 fruit growers at four district Horticulture Society meetings held in the State this spring is some indication of the desire by the growers to know the new developments in the fruit business of Michigan and other fruit producing states.

A very keen interest is shown in the new insecticide, DDT. The indications are that a large number of growers will adopt the DDT spray schedule for apples, pears, peaches and grapes. Experimental work with DDT in the State in 1945 was done with 25% wettable powder, 3 pounds per hundred gallons of water, which gave satisfactory control of codling moth, leaf hopper, Oriental peach moth, grape berry moth, rose chafers, and tarnished plant bugs. Some control was also achieved on green apple aphid and black aphid on sour cherries.

Apple scab took its toll of foliage on many apple orchards in 1945. Some of the most badly defoliated orchards will probably not blossom this year. Other orchards will be in varying stages of productivity, depending upon their state of vigor, but in general the outlook is good as of March 20.—C. A. Langer, Extension Specialist in

Horticulture, Michigan State College, East Lansing.

**NEW YORK**—As reported in a recent issue of the New York State Horticultural News Letter, edited by T. E. LaMont of Albion, Colin Nichols of Lewiston was elected president at the annual meeting of the New York Cherry Growers' Association. Other officers elected were: Earl Harding of Albion, vice-president, and Snow Wooster of Ontario, secretary-treasurer.

Dues for the year 1945 amounted to \$2,814 and the membership totaled 898. One hundred and forty-one members came in from the newly organized district around Erie, Pennsylvania.

The plan of cooperating with the New York State Horticultural Society in employing a full time executive secretary for the fruit industry of the State was approved by the Cherry Growers.

**PENNSYLVANIA**—Preliminary plans for the construction of a new laboratory building featured the annual meeting of the advisory committee of the Arendtsville Fruit Research Laboratory held at Peach Glen recently. The advisory committee, consisting of representatives of the fruit growers associations in Adams, Franklin, York and Cumberland counties, counsels with the workers from the Pennsylvania State College Agricultural Experiment Station regarding research conducted in the fruit region of the state.

The new laboratory building, according to present plans will cost about \$25,000 and will be financed by funds contributed on a non-profit agreement by individual fruit growers. The experiment station plans to rent the building from the growers, F. F. Lininger, Director, explained, with the understanding that the College may accept title of ownership at some later date.

**OHIO**—Recognizing the service of the Ohio Pomological Society, which served Ohio fruit growers from 1847 to 1867 when its officers and members continued on as the Ohio State Horticultural Society in order to broaden the base of operation and serve more horticultural interests, the Ohio State Horticultural Society decided at their annual meeting in Cincinnati to recognize 99 years of service to the Ohio fruit industry and prepared to celebrate 100 years of service with a Centennial Meeting next winter. A Centennial Meeting of the Ohio State Horticultural Society is scheduled for February 25, 26 and 27, 1947, at the Deshler-Wallick Hotel, Columbus, Ohio.

Thomas E. Thornburg, Ashland, Ohio, oldest living member of the Society was honored by election to the office of Honorary President for one year. He was further honored by election to Honorary Membership for life in the Society, as were other veteran members, Hiram Burkholder, Clyde and Dan Alban, Jackson. Mr. Thornburg has been associated with Society activities during the past 65 years.

(Continued on page 35)

## LESSONS IN ORCHARD CHEMISTRY

By E. D. WITMAN, Research Associate

Ohio State University Research Foundation

### ELEMENTAL SULFURS

Sulfur occurs in its *elemental* state in huge underground deposits especially around the Gulf Coast. It is used directly as it is recovered from these deposits for the manufacture of dusting sulfur and wettable sulfurs. Lime sulfur is a *compound* of sulfur and calcium and will be discussed in a later lesson. Flotation sulfur is a form of *elemental* sulfur recovered from various industrial gases.

Sulfur is insoluble in and not wetted by water. It melts to a liquid when heated slightly above the boiling point of water. When ignited it burns with a bluish flame, yielding sulfur dioxide, a colorless, choking, corrosive gas. One of sulfur's closest chemical relatives, selenium, is a very poisonous substance.

Dusting sulfur is made either by subliming crude sulfur to get finely divided "flowers of sulfur", or by grinding crude sulfur to a very fine powder. Dusting sulfur usually contains a few per cent of a conditioning agent or "breaker", such as talc, gypsum, etc., to prevent balling and make a free flowing powder.

Wettable sulfur is essentially the same as dusting sulfur except that it contains a little synthetic wetting agent so that it will readily suspend in water.

Flotation sulfur frequently contains soluble substances as it comes from the recovery process and these solubles must be removed by washing with water before a product satisfactory for use on plants is obtained. Flotation sulfur is usually sold in paste form.

Another *elemental* sulfur somewhat like flotation sulfur in performance is produced by emulsifying melted sulfur in water in the presence of a dispersing agent and then removing most of the water to form a paste or perhaps all of the water to produce a powder.

Sulfur is melted with bentonite clay, allowed to re-solidify and is then ground to a powder to produce various proprietary products. When added to water such products form fine dispersions of elemental sulfur.

Sulfur is generally used for its fungicidal action although it is known to be insecticidal to some species. Its action as a fungicide is not exactly understood, but it is relatively certain that some vapor evolved from sulfur is responsible.

Sulfur is regarded as generally compatible with most insecticides except the oils.





MISS NANCY ANDERSON

## QUEEN SHENANDOAH TO RULE BLOSSOM FESTIVAL

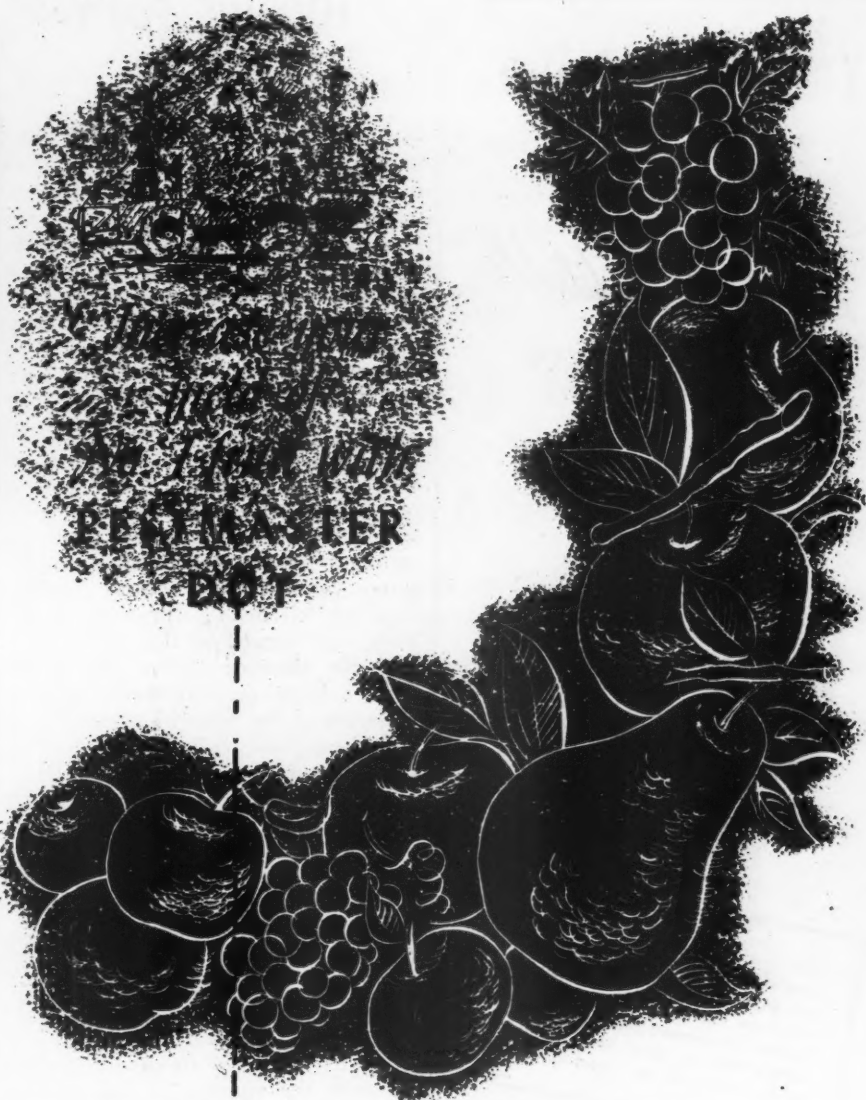
The famed Shenandoah Apple Blossom Festival being held at Winchester, Virginia, on May 2 and 3, will have as its lovely queen this year Miss Nancy Anderson, daughter of Secretary of Agriculture and Mrs. Clinton P. Anderson.

As Queen Shenandoah XIX, the first queen since 1941, Miss Anderson will rule over an estimated 100,000 loyal subjects who are expected to gather at Winchester for the two-day celebration.

Seventeen-year-old Miss Anderson, whose home is in Albuquerque, New Mexico, is a student at Mount Vernon Seminary, Washington, D. C. An active participant in dramatics and glee club work, Miss Anderson has also served as president and vice-president of her classes.

The 19th Shenandoah Blossom Festival has as its top committee worker Mrs. B. B. Dutton, who has taken care of the details connected with the Queen and her court since the sixth Festival in 1929. Mrs. Dutton's assignment has included contacting thirty schools and colleges who annually send young ladies to the Festival; writing and arranging the coronation scripts; entertaining the Court, costuming, transportation and housing.

During the thirteen years of Mrs. Dutton's stewardship the following queens were selected: Miss Mary Jo Matthews; Miss Suzanne Polard; Miss Priscilla Dacre Morton of Winchester, England; Miss Ames Washington; Miss Francoise May of Belgium; Mrs. John Hay Whitney; Miss Nella Veverka of Czechoslovakia; Miss Cornelia Larus; Miss Gretchen Thomson; Miss Adelaide Moffett; Miss Genevieve Garner; Miss Lillian Somoza of Nicaragua and Miss Mollie Foulks Lee.



**PESTMASTER DDT** Insecticide and Fungicide Formulations give closer control over destructive insects that attack your apples, peaches, pears and grapes.

**SCIENTIFICALLY CORRECT PREPARATIONS.** PESTMASTER 50% DDT Wettable Powder, PESTMASTER Fruit and Garden Dust, and PESTMASTER Fruit and Garden Spray, have been thoroughly field tested and approved by various agricultural colleges, experimental stations and the research department of the Michigan Chemical Corporation.

**KILLS.** Codling moths, green aphids, Japanese beetles, oriental fruit moths, peach tree borers, rose chafers, berry moths and certain other insects that come in contact with fruit or leaves are controlled with scientifically correct PESTMASTER DDT Formulations.

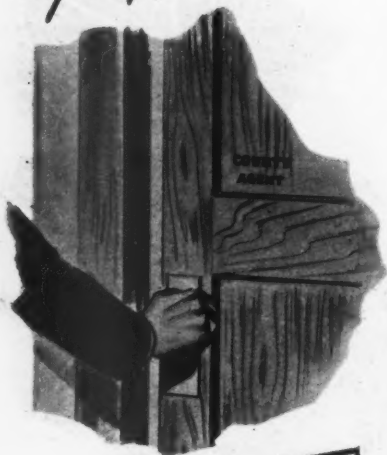
**EASY TO USE.** PESTMASTER 50% DDT Wettable Powders are compatible with wettable sulphurs, Bordeaux mixtures, fixed or proprietary coppers, summer oils, nicotine sulphate, fixed nicotine and DN compounds. Write us today for complete instructions regarding the use of PESTMASTER products for insect control on fruit, vegetables, and livestock. Limited number of dealerships still available.

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Alorco Cryolite will figure frequently in that program, because growers have proved it's an economical and dependable control for many chewing insects. It contains 90% chemically refined sodium fluoaluminate, the effective killing agent.

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A PRODUCT OF ALCOA

**ALORCO  
CRYOLITE  
INSECTICIDE**

## LOOKING FORWARD TO THE 1947 CROP

(Continued from page 11)

considerable development during summer and late fall and for several months or weeks prior to the time it opens in spring.

We can be reasonably sure that differentiation into either a leaf bud or a flower bud occurs just before or very soon after the cells surrounding the active growing point prepare to enter the rest period. Different buds on the same tree cease growth activity and begin their rest at various times during the season. Those on spurs, or short shoots, may begin to rest before the end of May; others, on more vigorous growths or on terminal shoots, may remain in an active condition for several months. In most varieties of apples, the flower buds are formed at the ends rather than the sides of shoots. In mature trees a large proportion of terminal buds are at the ends of spurs. Since the spurs grow for only a few weeks before the rest begins, it is safe to assume that the majority of flowers are initiated early in summer.

### Flower Forming Substances

This suggests that the factors which determine blossom bud formation for the following year's crop must exert their influence rather early during the present growing season. Appropriate internal chemical conditions of the tree tissues, especially those in the vicinity of the growing points, must be present even before we can see with the aid of a microscope that embryonic parts of flowers have appeared. These internal chemical conditions are referred to as flower-forming-substances and they include adequate reserves of carbohydrates, a minimum of nitrogen and other nutrient materials and also traces of hormones.

The prospects for a crop of apples in 1947 depend first of all upon a group of factors that favor the initiation, or that do not inhibit the development of flower parts, during 1946. It is not too early, therefore, to consider what, if anything, the grower can do during the next few weeks or months to help in getting the 1947 crop on its way. It must be recognized at the outset that weather and many other factors are largely beyond his control, but the little definite knowledge we have about flower bud formation in fruit trees may nevertheless be used to advantage.

At the present time, many apple orchards that were reasonably well cared for during 1945, but which had practically no fruits during that year, have many flower buds. It frequently

happens that an "off" year is followed by a heavy crop. An unusually heavy set this spring will definitely handicap flower bud production for 1947. It may also bring about a biennial habit of bearing in individual trees or orchards that could last for a number of years. This would mean that the even years, 1946, 1948, etc., would be "on" years and the odd years, 1947, 1949, etc., would be "off" years. Beginning in 1912 and lasting for 22 years, the apple crop in New York State in the "on" years averaged about 35,870,000 bu., and for the "off" years, 19,293,000 bu. Since 1932, the fluctuations in annual yields have been less violent although we still have alternation between large and small crops.

### Good Cultural Operations

The objectives of good cultural operations in the orchard in 1946 for those who are interested in regular bearing should be (a) to avoid too heavy a set of fruit, if this is possible and (b) to aim for a moderately good crop of high quality apples rather than a maximum tonnage. The following suggestions might be considered in this connection:

1. Special efforts should be made before the buds open to do a thorough job of pruning. This will involve the elimination of undesirable bearing surface that might set fruit but which would not be so located as to produce reasonably large, high quality, well colored apples. Wood which is shaded due to crowded growth on the under side of the branches, or in the interior of the tree, obviously comes in this class. In some cases, vigorous, well exposed bearing wood found on the top of tall trees, might well be removed, since fruit borne there often involves too much trouble and expense for spraying and harvesting. This is especially true if the tall, umbrella-like growth interferes with the penetration of sunlight to vigorous lower branches more easily reached in spraying and harvesting.

During the past years, many growers have found it difficult to do all the pruning that they had planned. This year, with many trees heavily budded, is an especially appropriate time to do more than the normal amount of pruning. Emphasis should be placed on the removal of the weak wood, leaving as much as possible of the vigorous bearing surface that is well exposed to light.

In mature trees, it is more important to maintain the existing bearing

(Continued on page 24)

AMERICAN FRUIT GROWER



## NATIONWIDE FRUITS

(Continued from page 13)

grapefruit. Today's tangerines are the result of completely modern methods of citrus growing unknown in the days of Columbus.

### Harvest Time

Early in the fall, trained pickers are in Florida groves to remove the first of the ripened tangerines from the trees. Belying their name, the "pickers" do not pick the fruit from the trees, but snip it off with blunt-nosed clippers. Since growers and state inspectors cooperate in sending only perfect fruit to market, each tangerine must be expertly clipped with a short stem in order not to bruise others during shipment.

Juice tests are taken by state inspectors right under the tree in the grove and only fruit that measures up to maturity standards is picked. These standards are established by the state legislature and supervised by the Florida Citrus Commission, to assure the highest standards both for the citrus industry and the ultimate consumer. Some 250 inspectors in groves, packing houses and canneries enforce the maturity, grading and sizing standards and issue the certificates which must be secured for all citrus fruit before it may leave the state for northern markets.

Dr. P. Phillips of Orlando, Florida (picture on page 13), is one of the largest individual growers of citrus in the state, and is the largest individual tangerine grower. His tangerine tonnage runs second only to that of the Florida Citrus Exchange which is a cooperative handling the packed fruit from nearly fifty cooperative houses scattered through the citrus belt. Dr. Phillips has one tangerine grove alone in a single block covering a square mile of land.

Dr. Phillips is a progressive, constructive operator who believes in the fruit he grows, and does his best to improve handling conditions within the industry so as to permit still greater increases in production and marketing capacity for tangerines.

## NUTS

### Black Walnuts Available

One of the most valuable trees native to Ohio is the black walnut, in the opinion of Robert R. Paton of the Department of Forestry at the Ohio Agricultural Experiment Station at Wooster, Ohio. It is found growing in many parts of this and neighboring states and finds a ready market for many uses.

The typical habit of the walnut

(Continued on page 27)

— Facts From The Source —

PAGE 5

For Better Apple and Peach Crops

**CONTROL CODLING MOTH**  
and  
**ORIENTAL FRUIT MOTH**

with  
**GESAROL\* AK 50 (Geigy DDT)**

This 50% DDT composition, by the originators of DDT insecticides, has proven that worm entries can be reduced to but five per thousand apples with a correspondingly low number of stings.

Peach growers, too, will find GESAROL AK 50 highly effective in the control of Oriental fruit moth. With Geigy DDT now available, you can increase your orchard yields and your profit! Geigy DDT compositions are dependable and economical to use. Their efficiency has been proven in exhaustive field tests.

Other GESAROL (DDT) compositions, each with a specific use in fruit culture, are available. In using DDT, look to Geigy for authoritative guidance—get your facts from the source.

### CODLING MOTH CONTROL

Apples—GESAROL AK 50 should be used at the rate of 1, 1½, or 2 lbs. per 100 gals. of water and applied in two to six sprays according to local recommendations.

### ORIENTAL FRUIT MOTH CONTROL

GESAROL AK 50 at 1 to 2 lbs. per 100 gals. of water will reduce the injury to peaches caused by the Oriental fruit moth. Or, use a 5% DDT-sulphur dust made by your distributor with GESAROL VD 50.

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about saving money"*



#### 5 Pick-ups For The Farm

6½' pick-up body on ½-ton  
... 7½' pick-up body on  
¾-ton ... 7½' pick-up  
body on 1-ton ... 9' pick-  
up body on 1- and 1½-ton.  
All bodies are 48½" wide;  
sides 17" high to top of  
flare.



#### Stakes and Platforms, Too!

7½' and 9' stake bodies on  
1-ton ... 9' and 12' stake  
bodies on 1½-ton ... 9'  
and 12' stake bodies on 2-  
ton. Chassis, with cab,  
available to take 14' bodies;  
cab-over-engine models also  
available where shorter  
wheelbases are desired.

**Y**ou don't farm very long without realizing that one of the best ways to increase farm income is to reduce farm costs.

That's why farmers rate *economy of operation* right along with *dependability* when asked why they stick to Dodge *Job-Rated* trucks year after year. And that's why *this year*—as new trucks again become available—more and more farmers are switching to trucks built to fit farm jobs, and thus save money on the job!

If you're not too busy to talk about saving money—ask your Dodge dealer why a truck built to fit the job will do a better job on your farm, save you more money, and last longer!

*Job-Rated for Economy*

**DODGE *Job Rated* TRUCKS**

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LISTEN TO THE MUSIC OF ANDRE KOSTELANETZ, WITH FAMOUS GUEST STARS—THURSDAYS, CBS, 9 P.M. E.T.

## THE 1947 APPLE CROP

(Continued from page 22)

surface in good vigor than it is to try to correct any faults due to previous years' pruning. In the younger trees, on the other hand, the grower should keep in mind that the full bearing surface has not yet been attained, and more attention might well be given to the removal of crowding and interfering growth with the object of developing a strong framework of well placed limbs along a main leader, with properly distributed secondary branches.

### Thorough Spraying

2. In most orchards throughout the eastern part of the country, the chances for scab in 1946 are very great because of the carry-over of heavily infested leaves from the bad scab year of 1945. Special attention should therefore have been given to the proper timing and thorough spraying with appropriate materials during the delayed dormant period to prevent primary infection. Pruning done in such a way as to facilitate the penetration of spray to all parts of the tree will help in this respect.

### Fertilizer Application

3. The fertilizer program in most well cared for orchards should not be stepped up. As many growers have learned from experience, an abundant supply of nitrogen, applied before bloom tends to increase the set of fruit. Pruning likewise favors a heavy set. Where the trees have been in good vigor for the past few years and where the fertilizer program has been on the liberal side, a slight reduction in the rate of application might be desirable especially if heavy pruning has been done. Perhaps ⅓ or ½ of the normal amount would suffice where the 1945 twig growth was very good. This reduced rate is recommended also in those cases where the red color on the apples in previous years was short of the requirements of Fancy or No. 1 grade.

A delay in time of application of nitrogenous fertilizer until after bloom might be desirable this year. The object of such delay would be to obtain the invigorating effects of fertilizer on growth without over-stimulation of the set of fruit. There is, of course, the danger of interfering with the development of red color if too much nitrogen is available during the latter part of the growing season. Where early cultivation is practiced less nitrogen is usually required than in the case of sod orchards, but the cover crop should be established early.

AMERICAN FRUIT GROWER



## CROP

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GROWER

### Cross Pollination

4. Many varieties of apples require cross pollination for a satisfactory set. But too much cross pollination may cause too many fruits to begin to develop. This early set tends to throw the trees into alternate bearing. Where bees are brought into the orchard to help in transferring pollen, it may be well to remove the hives after one day of good pollination weather, provided two or more varieties have been in bloom during that time. With weather and other conditions favorable, especially when many bees are present, only a few hours are required to do all the cross pollination necessary for a heavy set of fruit. Any additional pollination would simply increase the number of flowers that begin to develop into fruits, many of which will, of course, be eliminated during the June drop. In the meantime, however, these extra number of fruits will have drawn heavily on the food reserves of the tree. The heavy set also results in a reduction of the early leaf surface, which limits the manufacture of carbohydrates, and therefore prevents the necessary accumulation of food reserves which must be present for the initiation of the 1947 blossoms.

### Hand Thinning

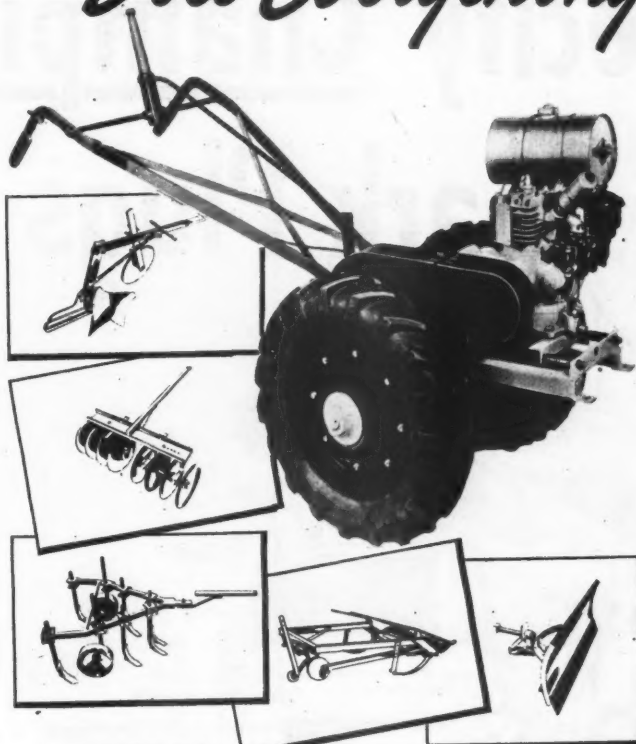
5. Where the set is very heavy, hand-thinning as soon as the fruits are a few weeks old is almost certain to result in larger apples. Such hand-thinning, however, usually comes too late in most orchards under eastern growing conditions to do much good in bringing about annual bearing year after year. The possibility of blossom thinning by spraying should be considered in this connection. Experiments under way on this problem indicate that individual varieties respond differently to the same treatment and that as yet no general recommendation applicable to all orchards can be made. Some growers, nevertheless, may want to experiment with at least a part of their plantings with the object of having some fruit to sell in 1947 as well as in 1946. Materials that are known to be harmful to bees when applied during bloom should be avoided.

Thus far we have considered trees that were reasonably well cared for and had fairly healthy foliage in 1945. Many fruit growers, however, may recall the rather sad appearance of the foliage on apple trees during the latter part of 1945 in some of the neighbors' orchards if not in their own. Too many orchards have been defoliated so early during the past season that they will have little or no bloom in 1946. The short growth on

(Continued on page 26)

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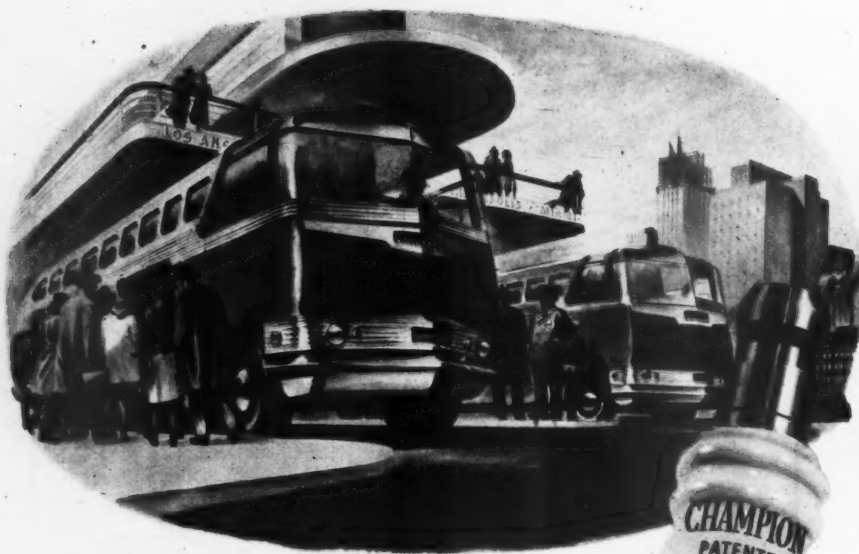
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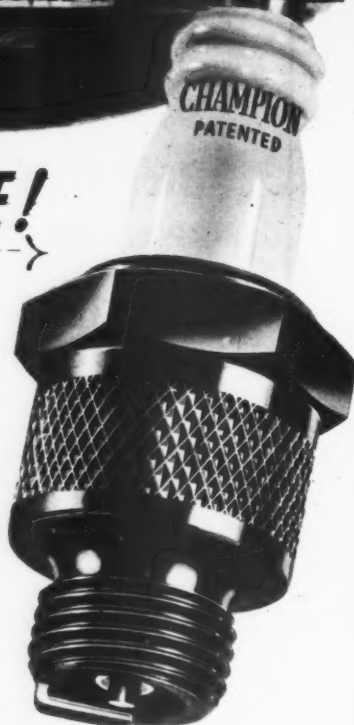
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## THE 1947 APPLE CROP

(Continued from page 25)

such trees is likely to be very spindly and the buds quite small.

Where the foliage remained green with relatively little scab until about the first of September, there may be some flowers present even though the trees are weakened. When the buds open, there will probably be only three or four flowers in a cluster instead of five or six, and the spurs will have small leaves, because of low reserves of stored food. The flowers will also be handicapped in setting a crop because of the lack of carbohydrate materials. With especially favorable pollination conditions, some fruit may be formed but it is very unlikely that the weakened trees will require any thinning.

### Handicapped Orchards

How should we manage these handicapped orchards so they can produce a good crop in 1947, if not this year? Apple trees often show a remarkable ability to recover from the effect of a poor growing season provided the buds and the wood are not damaged by cold during the winter. Trees that have little or no fruit in 1946 should naturally develop an abundance of bloom for the 1947 crop, especially if they are kept free from insects and diseases and are otherwise given reasonably good culture. The following practices are important:

### Practices to Follow

1. Thorough pruning to eliminate all dead or weak wood is the first step in rehabilitating the neglected orchard. The same procedure should be followed as previously suggested for the more vigorous trees. More wood, however, will probably have to be removed from the weak trees. Flower buds that may be present will be found on the well exposed portions of the tree. Such wood should be saved, if at all possible.

2. Since most of the defoliation last year was caused by scab, special efforts should be made to prevent another infection this year. It is well known that scab is likely to get on the exposed leaf surface soon after the buds break, and even before the flowers are open. No chances should be taken in "cutting corners" in spraying the orchards which were badly infested in 1945, even though there is little fruit in 1946.

3. Not much more than the normal amount of fertilizer should be used where the trees have no crops to support. Too much nitrogen could easily result in heavy sucker growth. The pruning, too, will help invigorate the trees.

AMERICAN FRUIT GROWER



## E CROP

(page 25)

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## GROWER

## Concluding Remarks

With the prospects at the present time for a large crop of apples in 1946, the consumers will have greater opportunity than they have had for several years past to discriminate in their purchases of fruit. They will probably have enough money and the inclination to pay higher prices for the better grades. Growers, therefore, might find it a good policy to pay special attention to the production of high quality apples.

The cultural practices suggested for the 1946 season, should result in a higher percentage of better grades of apples. If the trees are allowed to bear too heavily this season, they might easily be thrown into a biennial bearing habit, which means a small crop in every other year. The most practical way of avoiding this is to remove undesirable excess bearing surface by judicious pruning, and by aiming for a moderate set of fruit. These practices will tend to reduce the number but increase the size of individual fruits that develop. A good crop may thus be produced in 1946 while flowers are being initiated for the 1947 crop.

## NATIONWIDE FRUITS

(Continued from page 23)

is to grow scattered through the woods in mixture with other trees, or singly in fields and fence rows. It is rarely, if ever, found in pure stands. This characteristic tends to work to the disadvantage of the species, for cutting the trees may eliminate the possible seed crop in that vicinity.

It is important that more walnuts be planted in Ohio, and they should be set out wherever site conditions are favorable. Such a program will assure future generations of a continuous supply of this valuable timber.

Planting may be done either with seedlings or nuts, provided the latter have been stored in damp sawdust outdoors. Both methods are satisfactory and the latter is much more economical. Nuts for planting are still available at the State Forest Nursery, at \$2.00 per bushel, or 75 cents per peck. A peck contains approximately 250-300 nuts. There are no seedlings available this spring.

Any Ohio grower interested in the planting of walnuts for reforestation should write to the State Forester, Wooster, Ohio, for further information. Instructions as to planting method, selection of the site, and other information will be sent free of charge, upon request.



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MAY, 1946



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**CHIPMAN CHEMICAL COMPANY**  
Dept. K, Bound Brook, N.J.

## ORCHARD POLLINATION

(Continued from page 10)

mendation under such conditions. Such topworked trees should bloom in 4 to 5 years if the grafting is in branches not more than 1 to 2 inches in diameter.

In the meantime, while waiting for such grafted trees to begin to bloom, he can use hand pollination, as discussed in another article in this issue of AMERICAN FRUIT GROWER, or he can bring in branches of pollinating varieties.

### Pollinating "Bouquets"

The latter method has been proved effective if well done, and where bee activity is ample. It must be emphasized that many pollinating "bouquets" must be used, and they should be of large size. Generally pruning of the pollinizer varieties should be postponed to the bloom stage. Then a large crew must be put to work to prune the pollinizers and haul the branches to the orchard where they are needed. They must be kept from drying out—either by keeping them in barrels of water while being hauled, or by covering them with wet canvas and getting them placed in the orchard block within an hour or two after cutting. The larger the branches cut, the longer they will remain fresh and suitable for pollination purposes.

### Suspend Above Ground

Fairly large "bouquets" should be used—as many branches as can be put in a 3-gallon pail at each place. The best location is suspended above ground between the trees. If overhead spray pipes are installed some of the pails may be suspended from them. Tripods made by lashing or bolting props together, with the pail suspended below the point of fastening, may be used to keep the pollinating bouquets up in the air. It is the general experience of growers that bees will visit these pollinizers better if they are even a few feet off the ground, rather than set on the ground.

Branches  $\frac{3}{4}$ " or more in diameter should generally be used. Place them in the pails so the cut end is under water—and keep water in the pails so the blossoms will last several days.

As to the number of bouquets to bring in, it seems that "the more the better" applies. A minimum for good effectiveness would be a large bouquet for each 4 trees, putting the bouquet in the square between them. The bringing in of bouquets should start as soon as bloom is beginning

(Continued on page 29)

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For control many fruit insects  
NO HARMFUL RESIDUES

## Agicide Gold Dot Spray Base (50% D.D.T.)

For control codling moth  
Write for name nearest dealer

**AGICIDE LABORATORIES, Inc.**  
Racine Wisconsin

AMERICAN FRUIT GROWER



## ORCHARD POLLINATION

(Continued from page 28)

to open, with the number being increased up to the time most blossoms are open.

Even with pollinating varieties in the orchard it is still necessary to get the pollen carried to the blossoms. In the case of these self-sterile fruits this is entirely the work of insects, and mainly of free flying insects that move rapidly from tree to tree. This means mainly bees of various types. The only one of these types we can handle or in any way control is the domestic honey bee. We can move them into the orchard when blooming starts, and remove them before spraying with materials poisonous to the bees begins.

### Bees for Pollination

The following comments on handling bees for orchard pollination are made by Mr. James I. Hambleton, bee specialist of the U. S. Department of Agriculture:

"In general, it is preferable to move the bees into the orchard two or three days in advance of the actual start of bloom. This gives the bees time to become settled in their new location by the time the flowers are open.

"Emphasis should be placed on the importance of obtaining strong colonies. Colonies vary greatly in size. A strong colony, and particularly one rearing brood, may be much more effective than two or three weak colonies. Bees rearing brood have a tremendous appetite for pollen. This is particularly important from the standpoint of orchard pollination. The orchardist should insist on a standard of strength in renting colonies and should be ready to pay a premium for the strong colonies. Bees from strong colonies will work under more adverse conditions and will range wider than those from weak colonies.

### Competitive Plants

"Orchardists have sometimes observed that the bees seemed to work more on other blossoming plants than on fruit blossoms. Bees tend to work on the blossoms that are the richest source of nectar and will change quickly from one type of blossom to another if the latter bears a richer nectar—that is higher in sugar. Mustard blossoms, for example, contain about the same sugar content as apple blossoms, and compete directly with them for the visitation of pollinating insects. If there is abundant mustard bloom in and around the orchard during fruit bloom, the situation calls for more

(Continued on page 30)



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Gettysburg, Pa. or Redwood City, Calif.



### ORCHARD POLLINATION

(Continued from page 29)

bees or the mowing of the mustard if there is a question of adequate pollination.

#### Distribution of Stands

"The orchardist is often uncertain as to the best distribution of stands of bees. They are sometimes distributed singly throughout the orchard; at other times are congregated in rather large groups of colonies. Best results seem to be obtained when the colonies are distributed throughout the orchard not singly but in rather small groups of four or five colonies at a place. This reduces the work of looking after the bees, of distributing them and removing them from the orchard, interferes less with other orchard operations, and appears to be even better from the pollination standpoint.

"The minimum temperature for bee activity is about 50° F. Cloudy weather and winds also depress bee activity and limit the range of flight. Under such unfavorable conditions the importance of strong colonies is particularly apparent.

#### One Colony for Two Acres

"Under most conditions one strong colony for each two acres of orchard should be sufficient to insure adequate pollination provided weather conditions are at all favorable. During unfavorable weather, the more colonies used, the better."

This discussion has dealt mainly with apples. The problem with pears is similar. With sweet cherries and Japanese plums it is somewhat further complicated by the fact that a number of varieties are not only self-sterile but inter-sterile. The growers of these fruits must know the satisfactory pollinating varieties and provide for them in the orchard.

#### Transfer of Pollen

It is well also to keep in mind that even in self-fertile varieties pollen must be transferred from the stamens to the pistils. In good weather, but more particularly during bad weather, pollinating insects help in this essential step of transferring pollen.

If the fruit grower provides suitable pollinizers and has ample bee supply, and if the weather is moderately favorable, a good crop of fruits should be secured. At least the grower will have done what he can to insure it.

AMERICAN FRUIT GROWER



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# THE GREAT MYSTERY OF POLLINATION

(Continued from page 9)

sect would quickly starve; without the insect, the plant would lack fertilization and the species would perish. For eons this cycle of cooperation has been going on, unsuspected by either plant or insect.

## Honeybee Most Active

The honeybee is unquestionably the most active gatherer and distributor of pollen. In its quest for nectar, the busy little creature virtually wallows in pollen dust. The hairs covering its body and appendages are of the utmost importance in picking up the pollen grains which cling to the plant's stamens. When the bee emerges from a flower, its head, neck, legs and whole body are so heavily dusted with the powdery yellow grains that the insect more resembles a yellow-jacket than the familiar black bee. In going from flower to flower, it deposits this pollen on the pistils, thus accidentally pollenizing thousands of plants in the course of a lifetime.

## Hummingbirds Carry Pollen

The hummingbirds are international ambassadors of pollination. Most of the American species winter in Central America and each year migrate northward to Mexico, the United States, Canada, Alaska and Labrador. In their long flight northward they stop to feed on plant nectar, and in so doing carry pollen from country to country along the way.

In lieu of the act of copulation which accounts for the perpetuation of animal species, nature has provided plants with the regenerative process of pollination. What the male spermatozoa is to mankind, pollen is to a plant.

Methods of pollination are countless and while the end is the same—the fertilization of plants—the measures and subterfuges devised by nature to attract the pollenizing agents are ingenious and diversified in the extreme. To the layman it may seem that many of these methods leave everything to chance. This would indeed be the case were nature not so canny in placing temptation—in the form of nectar and pollen—in the paths of properly interested parties, specifically, the correct pollenizing agents. That the plan is foolproof is evidenced by the fact that all of our familiar flowering plants have come down through the ages intact. Presumably the ritual will continue through eternity.

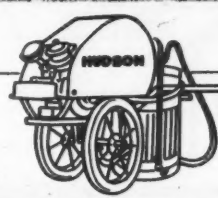
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From where I sit ... *by Joe Marsh*

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Folks argued that the new firehouse would never look well beside the old Town Hall. But they harmonize perfectly from the air. One side of the railroad tracks looks as good as the other. All the different landmarks blend in nicely with surroundings.

From where I sit, there's a lesson in that photograph. A community's made up of different elements—people as well

as landmarks. Some vote one way, some another; some enjoy a glass of beer and others don't. You might think there was a lot of reason for friction.

But it's all in your point of view. Get up high enough—see the community as a whole—and those little discords blend together into what we call America—a free, harmonious land. The differences only look big to people who see them from too close!

*Joe Marsh*

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## HAND POLLINATION

(Continued from page 14)

ering pollen and selling it to growers, hire collectors to gather the pollen in commercial orchards. Each collector has a quart jar with a medium mesh screen fastened over the top, replacing the cover. Usually two to three flowers are removed from a flower cluster leaving the central flower (king blossom) and one or two lateral flowers. The anthers are taken when the flowers are in the plump or "balloon" stage, which is just before the petals have spread apart. At this stage the anthers are still closed. The flowers may be open, but it is important that the anthers have not dehisced. A flower is removed from the spur, rubbed over the mesh screen so that the anthers fall in the jar. Blossoms are collected from all parts of the tree. In order to keep the pollen in good condition, it is measured frequently, and it is then kept in the shade until taken to the curing room. The gathered anthers are spread very thinly on large paper trays that are placed on racks or shelves. The drying room should be preferably kept at 70°F. During the drying process the anthers dehisce and release the pollen. After the pollen is dry, it is packed in ounce quantities in small containers and is then ready for shipment or use. Some dealers use a carrier with the pollen so that more blossoms can be pollinated with the same amount of pollen. Some of them mix the carrier with the pollen before sending it out; others send it and pollen separately and the grower mixes the pollen as he thinks necessary. As a result of careful investigation it is known that the pollen remains viable for two to three weeks at least from the time of curing. The pollen is usually tested for germination just before it is sent out. The purchaser of pollen should store it in a refrigerator or keep it at about 35°F. It is also very important to keep it dry.

### Use Artist's Brush

When applying the pollen to the flowers, persons doing the pollinating attach the container with a small amount of pollen to their clothing so that it can be easily and conveniently reached with a brush. A long-handled artist's brush of which the diameter of the bristle portion is about 1/4 inch is first dipped into the pollen, excess pollen is shaken off, and the brush applied to the blossom. The central blossom in the cluster is usually pollinated shortly after the petals have unfolded. It is important that pollen is placed on all five stigmas. The number of blossoms pollinated on a tree varies with the grower. It seems

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to growers, the pollen in each collector medium mesh cup, replacing the three flower cluster (king blossom) flowers. In the flow- "balloon" the petals stage the flowers important that ed. A flower, rubbed that the an- oms are col- ne tree. In a good con- uently, and until taken gathered an- ly on large on racks or should be During the dehis and ne pollen is quantities then ready me dealers len so that inated with Some of the pollen ers send it the grower links neces- I investiga- pollen re- three weeks uring. The r germina- out. The store it in at about important to

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best to pollinate every fourth or fifth strong spur. There is some tendency to pollinate too many blossoms. Sometimes one person takes care of an entire tree, and at other times, two to three people work on a tree, one pollinating the lower branches, while the others use ladders to get the tops of the trees. The time required to pollinate a medium-sized tree seems surprisingly short to those who have not seen the operation before. One person is expected to pollinate 15-20 trees a day.

Since Wisconsin growers experience difficulties in getting the Delicious to set fruit, we are planning to do some experimental work on hand pollination this spring to ascertain whether this method is adapted to Wisconsin conditions.

## BEEKEEPERS' VIEWPOINT

(Continued from page 16)

and if the ground is soft and wet, the fruit grower should lend a hand with his tractor to get the bees distributed through the orchard. In fact, the whole arrangement calls for neighborly cooperation. Under present labor conditions, the fruit grower may have a better supply of labor than the beekeeper. He might even help with the trucking. An outstandingly successful arrangement on a large scale was that of a northern Michigan commercial beekeeper who rented approximately 200 colonies of bees per year for a long period to pollinate a large commercial orchard nearly 100 miles away. The beekeeper guaranteed strength of colony and prepared the bees so that inexperienced helpers could handle the hives without being stung. He made certain that the bees were not going to starve while they were in the orchard. The fruit grower helped move the bees from the beekeeper's apiaries to the orchard and back again and helped distribute them through the orchards, and still paid the beekeeper a better rental price than some fruit growers are willing to pay when the beekeeper furnishes all the service. The fruit grower was well satisfied with the pollinating service and the beekeeper got enough out of it to make it worth while to do a good job.

Already fruit growers in some districts are finding it impossible to obtain the desired number of rental bees. In one county, the fruit growers are cooperatively buying approximately 200 colonies of bees to be operated by a skilled beekeeper. This arrangement should be satisfactory. In other counties, fruit growers are buying packages of bees to be operated by a

(Continued on page 35)



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Always dependable.  
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## OPPORTUNITY ADS

(Continued from page 34)

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HAVING CAR TROUBLE? NEW, USED, GUARAN-  
teed auto, truck parts save money. Transmission special-  
ists. Describe needs; immediate reply. VICTORY, 2930  
48 North Western, Chicago 18, Illinois.

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One Year. Only \$19.95. Used by the Navy. Splendid for  
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## FEWER HANDS... FASTER HANDLING

Stevedore Jr. Power Belt Conveyor makes produce  
handling easy and rapid. It takes the grunt and  
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Lightweight and easy to handle, Stevedore Jr. can  
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World's Fastest

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EASY  
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Falls trees. Saws big  
logs, small logs, limbs. Pulley  
for belt work. Easy to handle, weighs less than lower  
powered units. FULLY GUARANTEED. Cash in on fuel  
shortage. Turn wood lots into money. Book Free.  
OTTAWA MFG. CO., 532 Pine St., Ottawa, Kansas.

## BEEKEEPERS' VIEWPOINT

(Continued from page 33)

skilled beekeeper on either a cash or  
share basis. It seems likely that fruit  
growers will be more careful about  
spray poisoning their own bees than  
they might be of rental bees. In fact,  
it seems that there is no good reason  
for having bees in the orchard at any  
time except during the blooming sea-  
son.

Commercial beekeepers are as busy  
with their schedule as are fruit grow-  
ers. They have a relatively high in-  
vestment of from \$15 to \$25 per hive  
and depend upon a honey crop of \$10  
or more per colony, both of which are  
damaged by spray poisoning. Labor is  
short. Supplies are hard to get. The  
bulk of the bees are not located near  
the fruit belt. The risk of loss from  
moving the bees to new locations is  
complicated by the possibility that  
there may be foulbrood in the orchard  
area to which the bees are taken, and  
the bees may not get as much nectar  
from fruit blooms as they would in  
the open country from dandelion and  
other flowers. All in all, the average  
commercial beekeeper will not be at-  
tracted by a low rental price.

Some responsibility must be as-  
sumed by fruit growers for loss by  
spray poisoning. This is a community  
affair as well as an individual re-  
sponsibility since bees may fly a mile  
or more during warm days at bloom-  
ing time. No matter how careful the  
fruit grower himself may be, a neigh-  
bor who sprays out of schedule may  
poison all the bees in a square mile.

There are enough draw-backs from  
the beekeeper's standpoint to warrant  
his demand for some assurance to  
cover these unusual risks. It seems  
that the fruit grower faces the prob-  
lem of reducing losses from spray  
poisoning or of financing his own sup-  
ply of bees for pollination.

## STATE NEWS

(Continued from page 20)

The 1946 Proceedings of the Society is  
now on the press and will soon be in  
the hands of members, giving them the splendid  
papers at the Cincinnati meeting and at the  
summer meeting of the Society in 1945.

The Ohio fruit industry has applied for  
membership in the Ohio Council for Farm  
Cooperatives, and has voted L. G. Dean,  
Geneva, the voting delegate for fruit grow-  
ers on the Council. Associated with him as  
alternate advisers are H. L. Mantle, Paines-  
ville, and Harry W. Lutz, Carroll, for ap-  
ples, and representing the Ohio Apple In-  
stitute; Lester Luchsinger, Port Clinton,  
representing Ohio peach growers; Ben  
Davis, Clyde, representing cherry growers;  
and A. G. Hinz, Avon Lake, representing  
grape growers. The Council is interested  
in the overall problems of promoting legis-  
lative and marketing programs of best inter-  
est to both growers and consumers.—F. H.  
Beach, Sec'y, Ohio State Horticultural So-  
ciety, Columbus.

## BRIGGS & STRATTON ENGINES

As Always—Foremost in  
Value and Performance



Look with confidence to Briggs & Stratton  
4-cycle, Air-Cooled engines—"preferred  
power" in all fields—for the latest and  
most advanced developments for every  
application requiring 1/2 to 6 H.P. The  
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concentration of technical knowledge,  
modern plants, equipment, and skilled  
workers—builds gasoline engines which  
are more than equal to today's most exact-  
ing power and performance requirements.  
You can expect and get more value per dol-  
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you buy are powered by Briggs & Stratton.  
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## BORON in AGRICULTURE

For effective control of BORON  
deficiency disease, write for a copy  
of the newly revised "Boron in  
Agriculture." Pacific Coast Borax  
Company, 51 Madison Avenue,  
New York 10, New York.

**29**  
BORAX—BORIC ACID

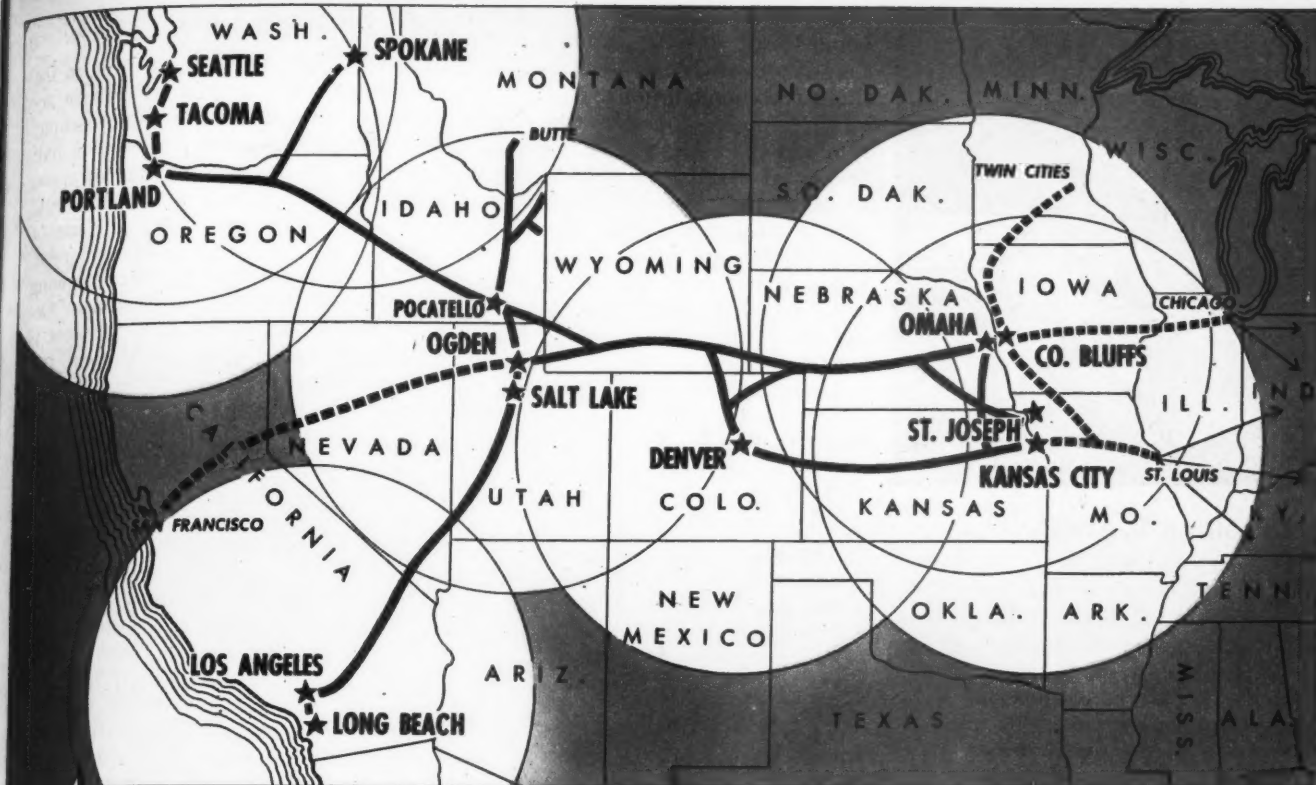
**PENETROL**

Makes Spray Chemicals  
Go Further—Accomplish More  
A STICKER and SPREADER for the Arsenates, the  
Sulphates, Bordeaux Mixture and Ground Derris.  
DILUTIONS—From 1 qt. per 100 gals. of water  
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An ACTIVATOR and WETTER for Nicotine Sulphate.  
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NICOTROL, a complete Nicotine Spray.  
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HUNT'S GRAFTING WAXES  
RODENT REPELLENT, ETC.  
M. J. Beck Co., Box 7, Lansing 1, Mich.







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The western territory served by Union Pacific is rich in countless raw materials required by industry; has power and other necessary facilities; has a high type of native-born labor. Here lies the opportunity for industry to build and expand.

Among the principal industrial tracts owned or served by Union Pacific are those located in, or near by, the following cities:

Omaha, Neb.	Ogden, Utah
Council Bluffs, Iowa	Portland, Oregon
St. Joseph, Mo.	Seattle, Wash.
Kansas City, Mo.-Kans.	Tacoma, Wash.
(Fairfax District)	Spokane, Wash.
Denver, Colo.	Los Angeles, Cal.
Salt Lake City, Utah	Long Beach, Cal.

As the map shows, all these cities are located on the main lines of the Union Pacific Railroad.

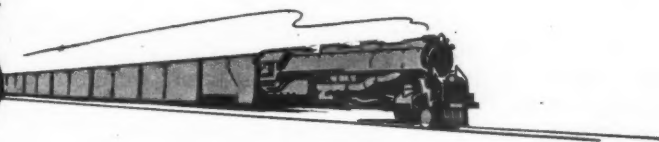
The circles on the map indicate 500-mile distribution areas. In normal times, Union Pacific operates a fast, merchandise freight (L. C. L.) service within these short-haul areas, with door-to-door pick up and delivery service.

These industrial properties are improved and occupied by many diversified manufacturing and commercial enterprises.

Necessary utilities are available and each tract is served by adequate industrial trackage. Whenever required, additional trackage can be provided.

You are cordially invited to write W. H. HULSIZER, General Manager of Properties, Union Pacific Railroad, Omaha 2, Nebraska, regarding industrial districts in territory served by Union Pacific.

be Specific -  
say "Union Pacific"



*The Progressive*

**UNION PACIFIC RAILROAD**

*The Strategic Middle Route*

## EDITORIAL PAGE

### AMERICAN FRUIT GROWER

E. G. K. MEISTER  
Publisher

J. H. GOURLEY  
Associate Editor

## A Golden Opportunity

THE SLOGAN—"Food Will Win the War and Write the Peace"—is familiar to us all. At the present time, wheat, flour and other grains are considered the major weapons of peace. The largest export of cereals in our history is planned to help ease the world food crisis that may prove to be the worst in modern times.

Wheat is important because, as Secretary of Agriculture Clinton P. Anderson said recently, "It can be shipped, stored, and rationed to large numbers of people more readily than any other food that will support life and can be obtained in quantity."

Curtailed in the use of flour and bakery products, which is a number one must on the government's program, undoubtedly opens a wider market for fresh commodities such as fruits. In taking the place of cereals, fruit and other fresh commodities can be considered another major weapon of peace.

Fears of surpluses in a country that produces ten per cent of the world's food supply have vanished. There should be a ready market for every fruit grown in 1946.

## Trends in Transportation

THE CONSUMPTION of fresh fruits and vegetables is definitely on the upgrade and with it goes the problem of better means of transporting high-quality produce from production areas to consumption centers.

Already improvements are under way in modernizing the present railway refrigerator car through proper refrigerating systems. The Pacific Fruit Express Company, which is jointly owned by the Union Pacific and Southern Pacific railroads, is planning to construct 2,000 new refrigerator cars. In 1945 the refrigerator car committee established by the industry through the United Fresh Fruit & Vegetable Association made a number of suggestions for

new refrigerator cars and the cars being built for the Pacific Fruit Company will largely conform with these recommendations.

Three inches of sidewall ventilation and three and one-half inches at floor and ceiling have been carried in cars constructed during the past year. Insulation details on the new cars have not been definitely announced but it is believed that they will carry four and four and four and one-half inch insulation, respectively.

Among other features to be included in the new cars are adjustable bunkers, half-stage icing devices, preco air circulating fans and sidewall flues.

The fact that the new cars are to be equipped with steel wheels and easier riding trucks will mean faster schedules for the fresh fruit and vegetable industry and better arrival condition for its produce.

## The Open Road

WITH WAR-TIME controls over automobile travel a thing of the past, the fruit grower can again expect his city customers to follow the lure of the open road and stop at his roadside stand for fresh produce.

So it's time to shine up the rusty hinges on your stand, put on a new coat of paint, and brush up on the essentials of roadside marketing.

The first place to start, of course, is in your orchard, vineyard or small fruit planting and grow high-quality fruit. Fresh, high-quality produce has been found to have a far greater drawing power than low prices—so build up a reputation for fruits of distinction.

Your roadside stand needn't be an elaborate affair. Just make sure that it's neat, well-painted, attractively landscaped, and above all, convenient to the consumer. Locate your stand from 30 to 100 feet off the main road so that travelers can drive up to your stand and be out of traffic.

And now that your customers have arrived, how about a pleasing display with plenty of eye appeal to tempt them into buying more than they really came for?

A customer would find it most disconcerting to make a trip to your stand just to find a sign that reads "Closed." So if you don't plan to keep your stand open at all times, be sure to advertise your business hours.

It's important to remember, too, that a pleasing smile and a friendly and courteous word has never handicapped any business. It's a sure-fire way to make customers remember you, your product and your roadside stand.

## At Blossom Time

MAYTIME IS blossom time in the orchard. It's a time of intense activity, both obvious and microscopic. It requires about a year and a half to produce a winter variety of apple, for instance. The blossom buds begin to form the latter part of June or early July and may continue longer. They do not open until the following May and the fruit is picked in October. So that the whole process is longer than one usually thinks. But the critical time is when the blossoms reach full bloom.

Now one should not confuse pollination and fertilization. The former is merely the carrying of pollen by insect, wind, or other agency from the stamen to the pistil, either of the same or of another flower. But fertilization is quite a different matter. The pollen grain germinates on the stigma of the pistil and the pollen tube grows down the style to the egg and discharges the male element or sperm. When this sperm or male gamete (marrying cell) unites with the egg, fertilization or sexual propagation occurs. Here we see two nuclei uniting to form one while in other parts of the plant body one cell divides to form two. After fertilization has taken place this first cell is called the "zygote" and it then divides and divides until the embryo in the seed is formed. Thus a new plant is formed from two parents.

But blossom time is a precarious time. So much hangs in the balance. If the temperature is cold or windy the bees and other insects do not fly and pollination does not take place. And unless seeds are produced the blossoms usually fall and no fruit results.

Or, if it is cold enough, the blossoms freeze with a 1945 result. Furthermore, if the temperature is low following pollination, even though it does not freeze, the growth of the pollen tube is so slow that fertilization never occurs.

Then there is the problem of nutrition of the young blossoms. If competition for food supply is great we find the blossoms falling because they starve, and this is apparently a critical matter particularly with certain varieties like Stayman Winesap and Delicious.

So, all told, Nature trembles in the balance about the time you are reading the May issue of the AMERICAN FRUIT GROWER. But most of the time "all's right with the world" and a bounteous harvest results. Little wonder fruit growing is an interesting vocation and that unusual people are attracted to it.



# OLIVER "TNT"



**NEW**

## Double-Function Plow!

It turns the topsoil. It breaks up plow pan. Two basic tillage operations performed at the same time by Oliver's new TNT Plow!

*How it does this job is of primary importance to you! Like any other plow, the "TNT" turns the furrow slice in the usual way. But, it loosens the ground *underneath* the topsoil without bringing sterile subsoil to the surface.*

Oliver's specially designed secondary bases break up plow pan and the plant-stunting colloidal silt layer to an adjustable maximum depth of 4 inches. Root penetration is facilitated . . . rainfall run-off is decreased . . . moisture readily sinks into the subsoil where it's stored for dry-spell needs . . . better aeration is provided . . . crop yields are increased.

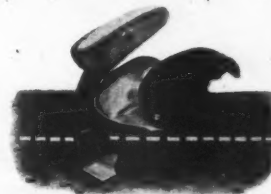
**The OLIVER Corporation**

400 West Madison Street, Chicago 6, Illinois



# OLIVER

**"FINEST IN FARM MACHINERY"**



Note how the secondary base breaks up plow pan without disturbing the topsoil.



Ask your Oliver dealer to tell you about the sensational new Oliver TNT Plow. It's a new soil conservation tool that will help save your fertile fields. Learn more about its valuable functions.



# *Fruit Protection Schedule—*

There's more money in the bank  
each year for growers who—

# *Ship more fruit —better fruit!*

Growers who wish to ship more fruit and better fruit know that reliable spraying and dusting materials properly applied are the backbone of any fruit protection schedule.

That's why growers stay with Dow products year after year . . . because Dow insecticides are closely checked for uniformity, economy, and ability to do a good job in combination with each other, which, of course, *results* in economy.

Together, these products add up to a close-knit, all-season protection plan that you can rely on with confidence. Ask your dealer or state experiment station for complete information.

## **PRE-BLOSSOM STAGE—Now is the time to aim for the market!**

"MIKE" SULFUR—microscopically fine, contains more than 95% active sulfur, wets instantly, covers thoroughly, gives superior finish to fruit, gives extra thorough coverage against apple scab and brown rot. **DOW DRY LIME SULFUR** is easy to handle, dissolves readily in cold water, imparts finish to fruit. **BORDOW** is an effective copper fungicide particularly recommended for leaf spot on cherries, prunes and plums. **DOW ARSENATE OF LEAD** is a reliable spray, controlling most leaf-eating and chewing insects.

Prevent build-up of red mites on apples during the summer months by spraying with **DN-111**. Don't wait till foliage becomes bronzed—start when one or two mites per leaf are present. **DN-111** gives excellent results either used alone or combined with sulfur or lead arsenate. It acts as a safener for arsenate of lead to reduce foliage injury; and it can be used with App-L-Set for mites present during the pre-harvest stage. Also available now—**Dow DDT-25 Wettable**—a concentrated powder for control of codling moth.



AGRICULTURAL CHEMICAL DIVISION  
**THE DOW CHEMICAL COMPANY**  
MIDLAND, MICHIGAN